TITLE OF INVENTION

Shelf life indicator components for fresh cut fruits and vegetables responding to carbondioxide

CROSS-REFERENCE TO RELATED APPLICATION

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO SEQUENCE LISTING

Not Applicable

BACKGROUND OF THE INVENTION

Fresh fruits and vegetables which are cut and prepared ready for cook or eat fresh are increasingly demanded by the consumers. However there is problem of shelf life, it is not easy to determine. Under estimation of the shelf life causes the higher production cost and over estimation causes brand reputation. Sometime prepared fresh fruits and vegetables are found senescence before the expire date on the packages. The package of prepared fresh cut is usually wrapped with polyvinyl chloride (PVC) films. The carbondioxide and oxygen permeability of PVC film is not suitable for cut fruits and vegetables which are highly respiration.

Two types of modified atmosphere packaging (MAP) are active and passive modifications. Cut fruits and vegetables actually pack in passive modification. Respiration of perishable goods in passive modification consumes oxygen and generates carbondioxide inside the package. When the carbondioxide level increases and oxygen decreases, the inner package respiratory system will switch to anaerobic. Anaerobic respiratory causes the flavor change and reduces the quality therefore decrease the shelf life of the cut fruits and vegetables.

DETAILED DESCRIPTION OF THE INVENTION

After anaerobic respiration occurred in the package of fresh cut, that causes of senescence of fresh cut. So it was lost quality and shelf life. The symptom was not predicted by labeled time on the package. We try to invent the indicator to detect shelf

life of fresh cut which is responded with CO_2 concentrate in the package. So it causes to anaerobic respiration. The indicator is describing:

1. The indicator was made of Methyl red and Bromthymol blue at the concentration of 0.001 to 1.0 w/v. They changed from green to reddish orange color due to CO_2 concentration in the package.
2. The mixture used $NaHCO_3$ as indicator buffer at the concentrate of 0.001 to 1.0 molar. It controls equilibrium of acidity and alkalinity of solution of indicator that react with CO_2.
3. Phenolic compound and it's derivatives from plants or synthetic are Anthocyanin, Flavones and It's derivative,. Betalien and it's derivative, Chlorophyll and it's derivative, Carotene, and Lycopene, at the concentrate of 0.001 to 10 w/v.
4. Distillation water dissolved the mixture.

After mixed and dissolved the ingredients, the green, yellow, blue or purple color was occurred due to type and concentration of the mixture.

Example

Mehtyl red	0.01 g.
Bromthylmol blue	0.005 g.
Anthocyanin	0.01 g.
$NaHCO_3$	0.42 g.
Distillation water	enough to dissolve

After prepared solution of indicator, that prepares the absorbent and sachet describes:

1. Indicator solution
2. Absorbent, it is made from plant fiber and celluloses which are purified and non purified material Or it is made from inorganic and organic material those do not react with ingredient of indicator.
3. Plastic, plant fiber and biodegradable plastic from starch base sachet, which are permeable for CO_2 transmission and it is not react with ingredient of indicator.

The indicator sachet is attached in the package of fresh cut that appear. When generated CO_2 in the fresh cut package was highly as it cause to anaerobic respiration. The indicator is changed green to red orange, red pink or red due to ingredient of indicator. It can detect the quality of fresh cut in the package as shelf life indicator. The customers or consumers can make decision to by the goods or not.

BRIEF SUMMARY OF INVENTION

This invention provides a new shelf life indicator for fresh cut fruits and vegetables which reacts with carbondioxide inside the package. The absorbents are organic and inorganic that are not react with organic and inorganic indicators and carbondioxide. The permeability material that proper for carbondioxide to enter to react with the indicators and also prevents the indicators to contact with fresh cut fruits and vegetables inside the package.